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EXAMINER

LE, THAO X

ART UNIT PAPER NUMBER

2814

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GROUP 2800

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/690,928
Filing Date: October 22, 2003
Appellant(s): HAN ET AL.

Nathaniel Levin
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11 Dec. 2006 appealing from the Office action mailed 21 Aug. 2006.

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(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6392898	Asai et al.	05-2002
6373719	Behling et al.	04-2002
6068782	Brandt et al.	05-2000

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Appellant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 6-7, 29-32, and 36-38 are rejected under 35 U.S.C. 103(a) as being obvious over US 6392898 to Asai et al. in view of US 6373719 to Behling et al. or US 6068782 to Brandt et al.

Regarding claim 6, Asai discloses an apparatus in fig.1 comprising: a substrate 30, col. 8 line 38, a pair of signal traces 34U, col. 6 line 13, formed directly on the substrate 30 and spaced from each other; a filler material 40, fig. 4(E) col. 8 line 57, directly on the substrate 30 and between the signal traces 34U, the filler material 40 having a dielectric constant, and a solder mask layer 44, fig. 4(G), col. 9 line 57, directly on the signal traces 34U and directly on the filler material 40, fig. 4(G), wherein the filler material 40 has a height that is substantially equal to a height of the signal traces 34U, fig. 4(F).

But, Asai does not expressly disclose the dielectric constant of the filler material 40 that is higher than a dielectric constant of the substrate 30 and the solder mask 44.

However, Behling discloses an apparatus in fig. 4 comprising a wiring board substrate 32, col. 5 line 32, a pair of signal traces 34/36, col. 5 line 35, formed directly on the substrate 32 and spaced from each other, fig. 2; a filler material 40, col. 5 line 39, directly on the substrate 32 and between the signal traces 34/36, the filler material 40 having a dielectric constant higher than a dielectric constant of the substrate 32. The material 40 includes ceramic

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(dielectric larger than 100) and various polymers including polyurethane (PU) (dielectric about 6) or fluoro and chlorofluoro polymer, col. 5 line 45 and col. 6 lines 8-10 that would have dielectric constant higher than the dielectric of wiring glass epoxy resin board (dielectric about 4) and solder resist material (dielectric about 4 or less). At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the dielectric material between signal traces teaching of Behling with Asai's device, because it would have provided over voltage protection as taught by Behling, see abstract. Furthermore, Brandt discloses the capacitor dielectric can be polymer including PU, ceramic, PVDF, and others, col. 4 lines 18-25.

At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the dielectric material teaching of Behling and Brandt with Asai's device for intended purpose, MPEP 2144.07, and/or to increase the capacitance of the structure.

Regarding claim 7, Asai does not disclose the apparatus wherein the filler material 40 has a dielectric constant in excess of 4.

However, Behling discloses the apparatus wherein the filler material 40 has a dielectric constant in excess of 4 for the same reasons as discussed in claim 6.

Regarding claim 29, Asai does not disclose the filler material 45a includes polyvinylidene difluoride (PVDF).

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However, Brandt discloses an apparatus wherein the filler material 120 includes polyvinylidene difluoride (PVDF), col. 4 lines 18-25.

At the time the invention was made; it would have been obvious to one of ordinary skill in the art to replace the filler 45a with the filler of Brandt, because it would increase the capacitance of the structure.

Regarding claim 30, Asai discloses the apparatus wherein a metal ground plane 34D, fig. 1 col. 8 line 42, on an opposite side of the substrate 30 from the signal traces, fig. 1.

Regarding claim 31, Asai discloses an apparatus in fig. 1 comprising: a substrate 30, fig. 1, a pair of signal traces 34U formed on the substrate 30 and spaced from each other, fig. 4(E); a filler material 40 on the substrate 30 and between the signal traces 34U, the filler material having a dielectric constant; and a metal ground plane 34D on an opposite side of the substrate 30 from the signal traces 34U, fig. 1; wherein the filler material 40 has a height that is substantially equal to a height of the signal traces 34U.

But, Asai does not expressly disclose the dielectric constant of the filler material 40 that is higher than a dielectric constant of the substrate 30 and the solder mask 44.

However, Behling discloses an apparatus in fig. 4 comprising a wiring board substrate 32, col. 5 line 32, a pair of signal traces 34/36, col. 5 line 35, formed directly on the substrate 32 and spaced from each other, fig. 2; a filler material 40, col. 5 line 39, directly on the substrate 32 and between the signal traces 34/36, the filler material 40 having a dielectric constant higher than a

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dielectric constant of the substrate 32. The material 40 includes ceramic (dielectric larger than 100) and various polymers including polyurethane (PU) (dielectric about 6) or fluoro and chlorofluoro polymer, col. 5 line 45 and col. 6 lines 8-10 that would have dielectric constant higher than the dielectric of wiring glass epoxy resin board (dielectric about 4) and solder resist material (dielectric about 4 or less). At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the dielectric material between signal traces teaching of Behling with Asai's device, because it would have provided over voltage protection as taught by Behling, see abstract. Furthermore, Brandt discloses the capacitor dielectric can be polymer including PU, ceramic, PVDF, and others, col. 4 lines 18-25.

At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the dielectric material teaching of Behling and Brandt with Asai's device for intended purpose, MPEP 2144.07, and/or to increase the capacitance of the structure.

Regarding claim 32, Asai discloses the apparatus wherein: the signal traces 34U are formed directly on the substrate 30, fig. 1; the filler material 40 is directly in contact with the substrate 30; and the ground plane 34D is directly in contact with the substrate 30, fig. 1.

Regarding claim 36, Asai discloses the apparatus wherein the substrate 30 includes a resin, in which fibers are embedded, col. 8 line 38.

But Asai does not disclose the dielectric constant of the filler material 40 being higher than a dielectric constant of the resin.

However, Behling discloses the apparatus wherein the substrate 32 includes a resin, in which fibers are embedded, col. 5 lines 32-34, and the dielectric constant of the filler material 40 being higher than a dielectric constant of the resin for the same reasons as discussed in claim 6.

Regarding claims 37-38, Asai discloses the apparatus wherein the signal traces are formed of copper, col. 8 line 42, wherein the filler material 40 substantially fills a space between the signal traces 34U, fig. 1.

(10) Response to Argument

Appellant arguments filed 11 Dec. 2006 have been fully considered but they are not persuasive because:

- a. The Appellant argues that Behling teaches the variable voltage material 40, having a high dielectric constant, is to be filled in between a contact portion 34 and a ground bar 36 for the purpose of isolating contact portion 34 and the ground bar 36 during normal operation, and to channel current from the contact portion to the ground bar if a high transient voltage occurs. In response to Appellant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are

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based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Furthermore, the examiner submits that replacing Asai's filler with higher dielectric filler of Behling does not change the principle of operation of the primary reference or render the reference inoperable for its intended purpose. See MPEP § 2143.01. In fact, such higher dielectric constant filler would enhance the Asai's device as discussed above.

b. In response to Appellant's argument that there is no need to replace Asai's resin filler with filler having a higher dielectric constant than a substrate, the fact that Appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In addition, the Appellant may use the higher dielectric constant between a pair of signal line for different purposes. However, it is not necessary in order to establish a prima facie case of obviousness... that there be a suggestion or expectation from the prior art that the claimed invention will have the same or a similar utility as one newly discovered by the Appellant *In re Dillon*, 919 F.2d at 692, 16 USPQ2d at 1900. Thus, it is not necessary that the prior art suggest the combination to achieve the same advantage or results discovered by Appellant. See MPEP § 2144.

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- c. The Appellant argues that neither signal line in Asia is a ground. The Examiner respectfully disagrees because Asai discloses the signal line 34U and 34D are used as ground layer, col. 6 line 14.
- d. The Appellant argues that Asai' neighboring signal lines are not capacitor. This is not persuasive because any one of ordinary skill in the art would recognize or understand that a dielectric layer in between two conductors is a capacitor.
- e. The Appellant argues that layer 44 of Asai is not a solder mask (is being defined as a material having insulative property). The Examiner respectfully disagree because a polymer composition of layer 44 (interlaminar resin is insulating material) of Asai as disclosed in col. 7 lines 37-60 would read on the solder mask layer as claimed. Apparently, the Appellant argues that the composition of layer 44 is different from that of the instant application, it is noted that such composition of the solder material is not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Thao X. Le *T.L.*

27 Mar. 2007

Conferees:

Mr. Wael Fahmy, SPE *W.F.*

Mr. Ricky Mack, SPE *RM*